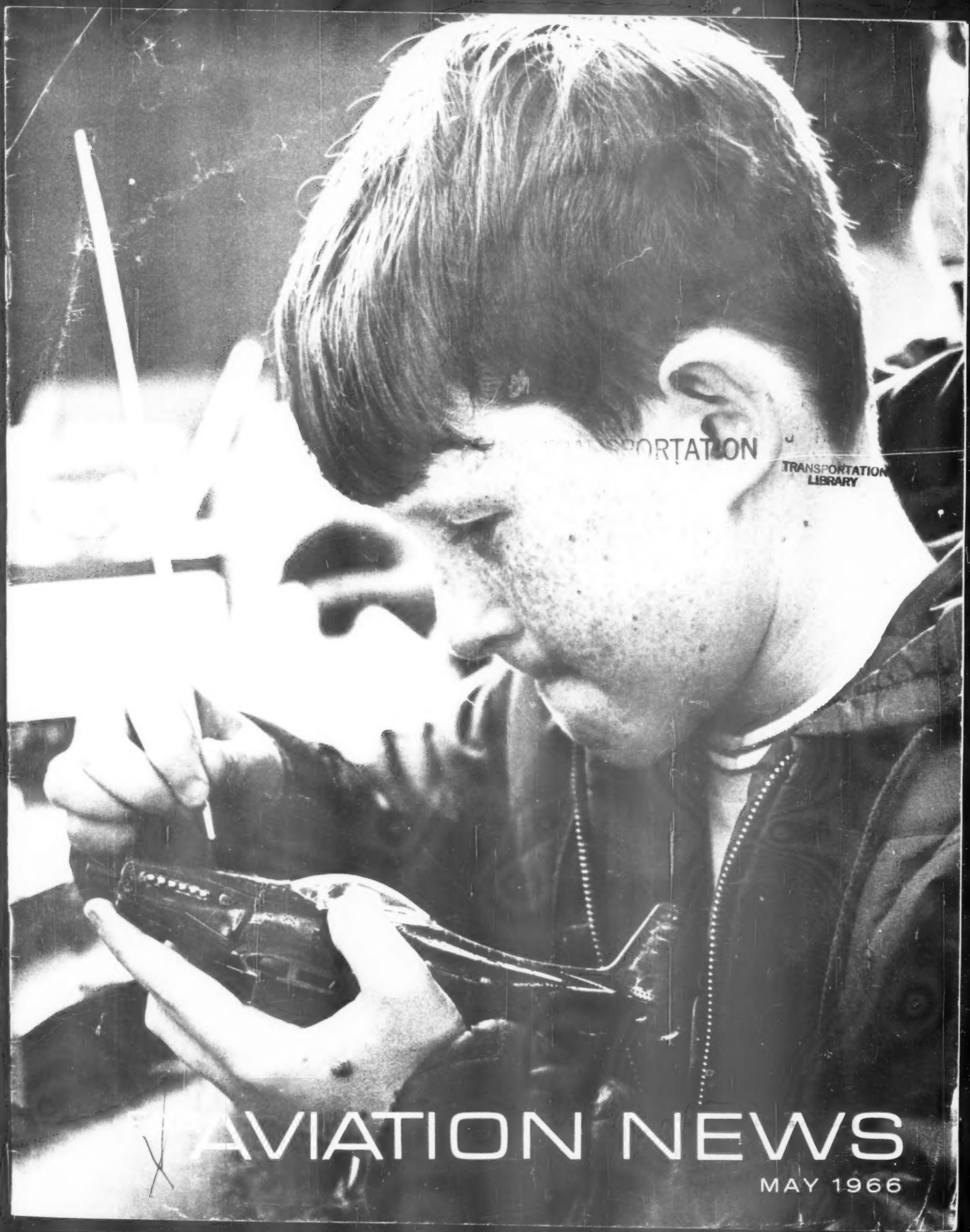

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AVIATION NEWS

MAY 1966

Today, 11-year-old Terry O'Mahoney concentrates on a fine point of detail on the P-51 Mustang he entered in the Washington, D.C., model building contest. Tomorrow, who knows? (Photo by Dick Mowrey; story on page 12.)

FAA AVIATION NEWS
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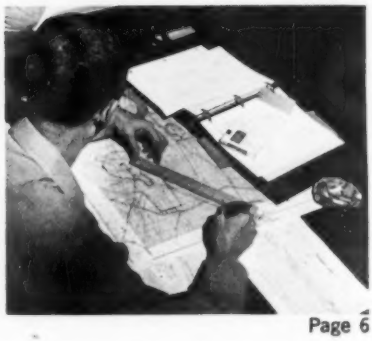
CONTENTS / May 1966

3 A Personality of Its Own
4 Pilot Had Passed Out . . . 'We Have an Emergency'
6 If I Had the Wings . . .
8 Don't Let Your Engine Die of Thirst
10 Water, Water Everywhere
11 Top of the World
12 Alaskan FAA Flying Club Wins Top Award
12 Junior College of Aeronautical Knowledge
12 Safety Stressed in 7th Annual Federal Aviation Agency Report
12 Group Named by FAA to Alleviate Problems of Aircraft Noise
13 New 'Student Pilot Guide' Heads List of Available Publications
13 Navajo, Lear Jet 24 Certificated by FAA
14 36 USAF Aero Clubs Honored for Perfect Safety Record in 1965
14 Wake Turbulence . . . You've Read the Book; Now See the Movie
15 Letters

Page 5



Page 6

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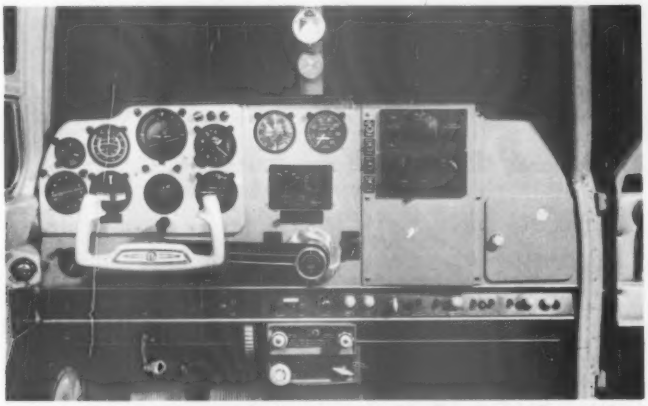
Familiar planes change characteristics with different loads. Have an instructor check your ability to fly a plane you're not familiar with.

Every plane has

A Personality of Its Own



Know the panel of the plane you fly. The panel of two planes can appear similar, yet differ in important respects.

Familiarity breeds complacency, to put a bit of a twist to an old saying, and it applies with special force when the subject is airplanes. That they are not all alike is obvious, but what is not so plain is why so many pilots assume an across-the-board expertise in *all* aircraft just because they are checked out in one or a few.

Accident records show clearly that a pilot takes unnecessary risks when he attempts to fly any airplane without familiarizing himself with its characteristics and operating procedures. The increasing complexity of modern airplanes emphasizes the importance of a thorough checkout for pilots who change from one type of airplane to another with which they are not familiar. The similarity of controls leads many to the mistaken belief that full pilot proficiency moves with the seat of the pants from one airplane to another, regardless of weight, speed and operating limitations and requirements.

Size is just one consideration. It is just as important for the airline pilot who regularly flies heavy aircraft to obtain a checkout in a smaller airplane he proposes to fly, as it is for him to have one when he advances to a larger transport airplane. But size alone is not the important consideration. Airplanes are as different as people, and the only safe and sure way to know them is to be properly introduced. Now, what are the important points of introduction?

- *Before Flight.* Study and understand the airplane flight and operation manual. Be sure that you understand its fuel system (see page 8), empty and maximum allowable weights, loading schedule and preflight inspection procedures.
- *Learn the Cockpit.* Study the control, instrument and radio layouts until you are proficient enough to pass a blindfold cockpit check.
- *Engage a Check Pilot.* Obtain the services of a check pilot who is fully qualified in the type of airplane concerned. *This is very important.* The check pilot should be not only well qualified in the airplane to be used, but also a qualified instructor.
- *Learn the Flight Characteristics.* Do not limit your familiarization to practice takeoffs and landings. Be sure you know the stall and slow flight characterisitics. Learn and practice all pertinent emergency procedures. Use all recommended flap settings.
- *Learn the Gross Weight Characteristics.* Include in your checkout takeoffs and landings with a fully loaded airplane. Most four-place and larger airplanes handle quite differently when loaded to near gross weight, as compared with operations with two occupants in the pilot seats.
- *Rely on Your Check Pilot.* Accept the decision of your check pilot as to when you are qualified. Don't attempt to proceed on your own before your checkout is completed. Half a checkout may prove more dangerous than none at all.

"We have an emergency."

These words from an inexperienced copilot set the Lexington, Ky., tower in motion. Contact was made quickly with two pilots familiar with a COMANCHE 400. One, fortunately, was already in the area flying an AZTEC; the other joined the FAA controllers in the tower. Together they talked the plane to a safe landing.

The emergency was a real one. The pilot who had passed out in flight never regained consciousness. The copilot, who had never flown a plane as sophisticated as a COMANCHE 400, had not flown at all for 15 years. His two passengers were not pilots. Here is a partial transcript of the tape:

This Comanche 400 photo, taken by Piper, shows the same type of aircraft Glen A. Simmons was flying when he passed out over the skies of Kentucky.

Pilot Had Passed Out

'We Have an EMERGENCY'

COMANCHE 400: This is N8450P calling Lexington radio.

LEXINGTON FAA TOWER: Go ahead.

COMANCHE: This is the copilot; we have an emergency here. The pilot has passed out and we are flying in a *Comanche 400* which I have never landed. We're on a VFR from Chattanooga to Toledo, Ohio. We're going to try to come down to a lower altitude and perhaps a little more oxygen might revive him. We don't quite know what to do.

TOWER: What is your altitude now?

COMANCHE: Altitude right now is 5,250 feet.

TOWER: OK. Lower altitude wouldn't help you. . . . Can you give me an estimate on your position?

COMANCHE: Position is probably about eight or 10 miles north of Lexington.

TOWER: Are you familiar with the use of the VOR?

COMANCHE: Yes, I am.

TOWER: OK. You want to make a 180 if you're still heading north and come back toward Lexington—toward the VOR—and you should have the field in sight prior to reaching it and in case you don't, you will have a position to start from.

COMANCHE: This is Five Zero Poppa. Heading back on a course of 130.

TOWER: OK. We do have a radar fix on you from the center eight miles north of the airport. You should have us in sight momentarily. We should be on your left. . . . (FAA controller Vaden Wagoner called down to one of the hangars to see if there was a pilot present familiar with the operation of a *Comanche 400*; Steve Kurtz, chief pilot for Blue Grass Airmotive responded by coming to the tower cab. Controller Russell Amerson, who was in contact with Richard Gottlieb, the *Comanche* copilot, contacted a departing *Aztec* pilot, Tom Block, and ascertained that Block was familiar with a *Comanche 400*. Block, a former local pilot, is now copilot for Mohawk Airlines.)

TOWER TO AZTEC: OK. There's an aircraft off to your right side—the pilot is passed out. I'm talking to the copilot now and you might be able to help get him down. . . . He is listening on the OMNI. . . .

AZTEC: OK, I've got him in sight. What kind of qualifications does the copilot have?

COMANCHE: I am a qualified pilot, but I haven't flown in many years. . . . I have never flown any plane such as this. The best I've done is a Taylorcraft about 15 years ago. . . .

TOWER: OK, we had you in sight a moment ago. You passed the airport about four miles northeast of us and I believe the airport is off to your rear right now. Do you have the airport in sight?

COMANCHE: Right rear?

TOWER: Affirmative.

TOWER: You passed north of us; we were right off your right wing and you've gone past now so we'll be slightly behind your right side.

COMANCHE TO TOWER: Do you want to give me headings?

TOWER: I'm afraid to do that right now because I don't have you in sight. But 270 heading should bring you to the airport or at least get you in a position where you can see it.

AZTEC TO TOWER: I think we have him in sight just north of the city.

LEXINGTON TOWER: That's probably him, Tom. He was on a 130 to the VOR.

AZTEC TO TOWER: OK. Stand by. We'll come on up to him.

AZTEC TO COMANCHE: Five Zero Poppa, can you read Three Five Yankee?

TOWER TO AZTEC: Don't believe he can, Tom. Let me see if I can get him to listen to 126.7.

LEXINGTON TOWER TO COMANCHE: Five Zero Poppa, can you tune your receiver also to 126.7? I have another aircraft in the vicinity with a pilot that knows all about your aircraft and he's going to try to help you. . . . You are now transmitting on that frequency. I want you to receive on it also, so you can hear the other pilot.

COMANCHE: Roger.

AZTEC TO COMANCHE: OK Five Zero Poppa, this is Three Five Yankee. I read you pretty well. How do you read me?

COMANCHE: I read you well.

AZTEC: OK. You're just coming up on the city heading south. Am I correct?

COMANCHE: I'm heading north now; I'm heading west, rather, about 250.

AZTEC: Hold just the heading you have. We have a target in sight and we are going to pull up alongside of you. You see if that's us. . . .

COMANCHE: We have quite a bit of fuel. . . .

AZTEC: What's your altitude, sir?

COMANCHE: Altitude is presently 1,800 feet. . . .

AZTEC: Are you sitting in the left or right seat?

COMANCHE: Right seat. . . .

AZTEC: What's the condition of the pilot?

Above, Tom Block, who flew the Aztec. Left, Richard Gottlieb who found himself flying a Comanche 400 for the first time.

Pilot Steve Kurtz, right, came to the tower and helped talk Gottlieb to a safe landing.

COMANCHE: The pilot is out, period.

AZTEC: OK. Thank you.

AZTEC TO TOWER: I guess you ought to have an ambulance standing by for the pilot.

TOWER TO AZTEC: Will do, Tom.

AZTEC: Five Zero Poppa, we're pulling up right along your right hand side. Do you see us?

COMANCHE: Affirmative.

AZTEC: OK. Good. Climb on up to 2,500 feet if you can with no problem. Just hold plenty of air speed. Don't let your airspeed get any lower than 125.

COMANCHE: Roger.

AZTEC: Do you have the airport in sight to your right? They have all the lights on.

COMANCHE: Affirmative.

AZTEC: OK. Come on up to 2,500 feet and circle the airport to your right and you get into the traffic pattern for the airport. Circle it to the right.

COMANCHE: Affirmative.

AZTEC: Five Zero Poppa, how many passengers do you have on board other than yourself and the pilot.

COMANCHE: Two passengers.

COMANCHE: Making a right hand turn now toward the airport.

AZTEC: OK, you can see the main runway there, that's runway 4-22. We'll be landing on runway 4, when we do land. Just circle the airport 2,500 feet to the right.

COMANCHE: Affirmative.

AZTEC: Do you feel that you are going to have any difficult in flying the airplane to a landing?

COMANCHE: I think once I am headed in to the runway, I *can* make it.

AZTEC: You say you *can* make it?

COMANCHE: Yes, I do.

AZTEC: OK, we're just landing with the flaps up, so don't worry about the flaps. . . . Do you know the position of the landing gear switch?

COMANCHE: The landing gear is down now.

AZTEC: OK. Do you have a green light indicating landing gear down?

COMANCHE: When the navigation lights are on, it doesn't light up.

AZTEC: OK. Does it light up when you turn the nav lights off?

AZTEC TO TOWER: . . . Do you have him in sight? I've lost him.

LEXINGTON TOWER: He is parallel to the main runway heading east.

AZTEC TO COMANCHE: OK. We've got you in sight now. Did you say the gear is down and is showing a green light?

COMANCHE: One moment, I have to find the switch for the navigation lights.

AZTEC: OK. Stand by and call me back.

COMANCHE: The green light did go on.

AZTEC: OK, thank you Five Zero Poppa. The only other switch we're going to need, I'd like you to turn on now if you can—the landing light switch. It should be over by the electrical switches, underneath the pilot's control wheel.

COMANCHE: Lights are now on.

AZTEC: OK, thank you.

AZTEC TO TOWER: Lexington, do you observe the landing lights on the aircraft?

TOWER: Negative, Tom. He's heading southwest right now. I see him, but he's heading the wrong way.

AZTEC: OK.

TOWER: Tom, do you want to fill him in on the elevation and the altimeter setting?

AZTEC: Yes. Stand by a minute.

COMANCHE: Making a right turn going around the airport.

AZTEC: OK, Five Zero Poppa, now we will be landing, I believe, on this one if you feel up to it. The elevation's 1,000 feet and the altimeter is 30.23 if you know how to set the altimeter. If you don't, disregard it.

COMANCHE: I know how, but I can't get over to that side of the plane so I'll disregard it.

AZTEC: OK, fine, just disregard it. We have the gear down?

COMANCHE: The gear is down.

AZTEC: All right. We will be landing out of this pass so just parallel the runway on a southerly heading or southwestly heading about 220 and when we get out about two miles from the airport, we'll turn and you can land on this attempt.

COMANCHE: Affirmative.

AZTEC TO TOWER: Have you got any equipment standing by?

TOWER: We've got the airport equipment and also one from the county on the way out.

AZTEC: OK.

TOWER TO AZTEC: Tom (Block), this is Steve (Kurtz) at Blue Grass. Will you ask him if he is familiar where the brake is? I believe it is a hand brake; I don't believe he has toe brakes on his side. Also, have him leave the prop control alone and control his descent with manifold pressure only. And not to let the speed get below 110—one hundred and ten.

AZTEC: Yes, we are going to get that in a second.

AZTEC TO COMANCHE: The brake is the master handle between yourself and the pilot. Can you find it?

COMANCHE: Yes, I know where that is.

AZTEC: OK. With flaps up you don't want to be touching down with any less than 110 indicated. Make the approach indicating about 130-135. Use the throttle to control your rate of descent. If you start getting low add more power. Five Zero Poppa, are you prepared to land out of this pass?

COMANCHE: Yes, I am.

AZTEC: OK, just swing around. You've got the runway right in front of you. The wind is right down the runway. Use your power to control your descent. What's your air speed right now?

COMANCHE: Air speed right now is 150.

AZTEC: OK, just pull the power back a little bit and see if you can line up with the runway.

AZTEC: OK, Five Zero Poppa, you look real good. Now don't acknowledge any more transmissions. Just keep your airspeed about 135, and don't let it drop any lower than 110. Use the power if it gets slower than that.

AZTEC: Five Zero Poppa, the first stretch of lights are not the runway. (The runway starts at the green lights.) Those are the approach lights.

AZTEC: Now don't try to land at the very end. Just take it down a little bit.

TOWER TO AZTEC: OK, Tom, I have him now up in the tower. He looks real good.

TOWER TO COMANCHE: Keep your wings level, Five Zero Poppa. Wings level. When you're over the end of the runway, close the throttle completely. Close the throttle completely. OK, you're good, close the throttle, Five Zero Poppa. Close the throttle completely. Just keep your nose down and keep the throttle closed. When you feel the wheels touch the ground, get on the brake. Close the throttle. Completely close the throttle. Throttle off!

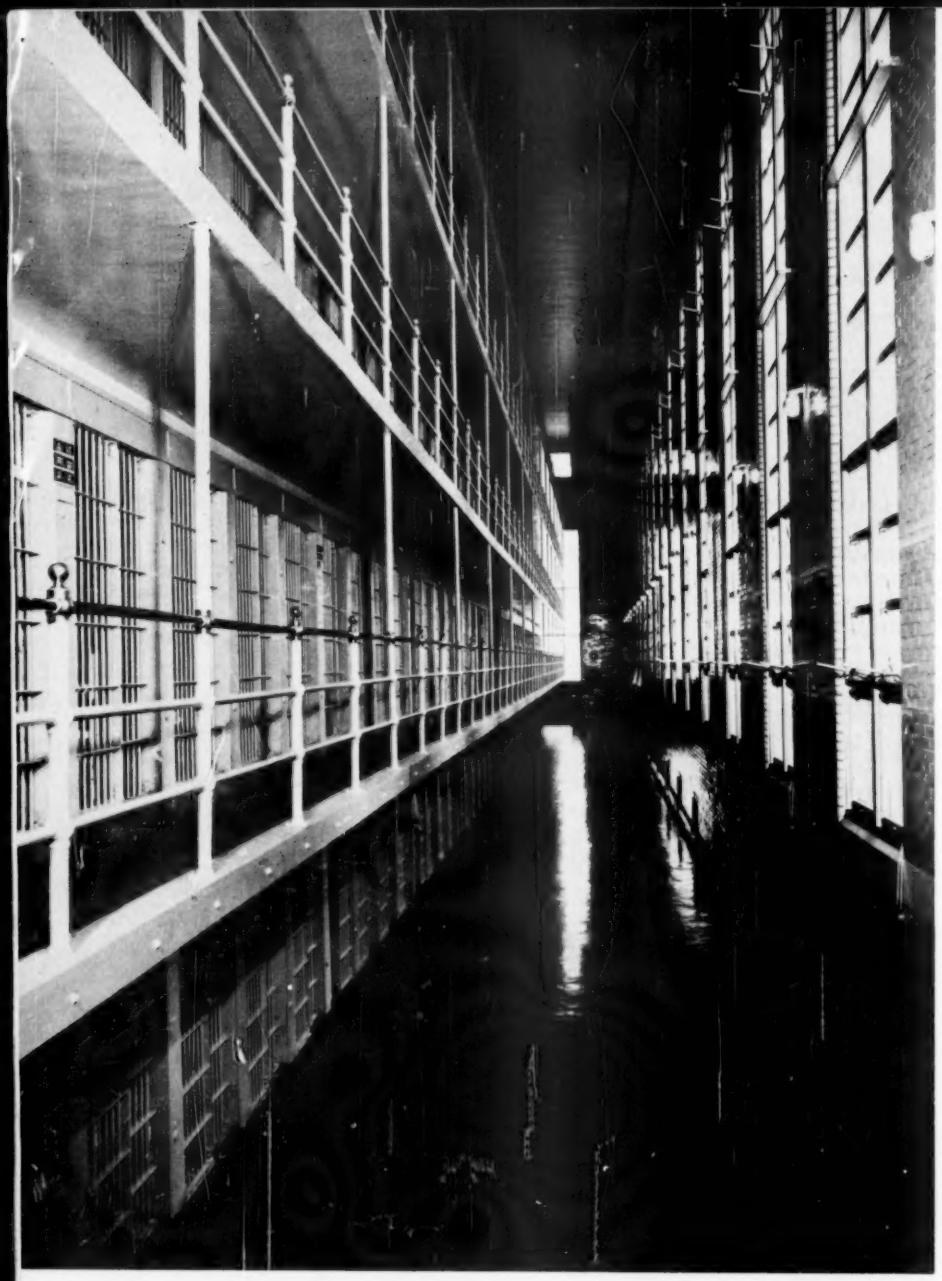
TOWER: OK, you're on the ground; you got it made!

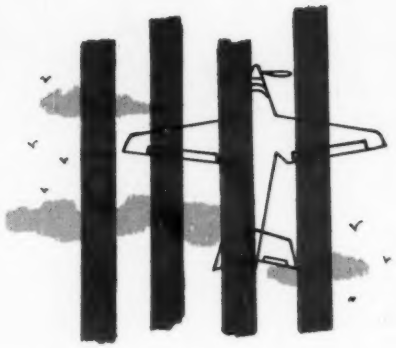
AZTEC TO TOWER: Three Five Yankee, we're going on to Lima, I'll be back a little later, Russ.

TOWER TO AZTEC: Thank you very much, Tom. . . .

TOWER TO COMANCHE: Five Zero Poppa, follow the truck.

TOWER: Five Zero Poppa, you did a good job.





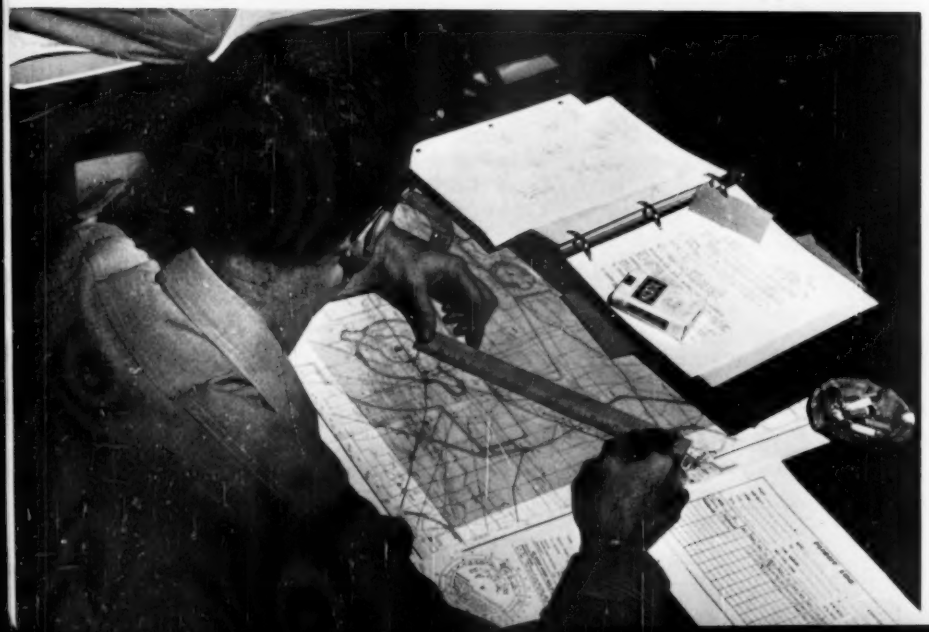
If I Had the Wings . . .

This is the story of prisoners, prison officials and a few outsiders who, without fanfare, have written a remarkable chapter in American aviation.

Doug—who plays the lead in the story—entered the Federal penitentiary in Atlanta four years ago. He had been a pilot with one of the nation's major airlines, a 48-year-old flying veteran with more than 12,000 hours. Before joining the airline, Doug had seen aerial combat during the Battle of Britain, flew the Hump as a civilian pilot with the Air Transport Command, served two years as a naval flight instructor, and put in time as a bush pilot in Canada. But Doug the man—not Doug the pilot—made a costly mistake and is now serving his sentence.

Like most inmates, he sorrowfully contemplated what might have been and was determined to overcome loneliness and boredom. With the approval of the Department of Justice and with the full support of Atlanta Federal Penitentiary officials, Doug began to use every minute of his free time to develop an extraordinary first—the introduction of FAA-approved aviation ground school instruction within a penal institution.

Starting three years ago with a handful of students and a collection of crude, home-made materials, Doug and his outside allies designed "Dynamics of Aviation," one of the most polished, professional ground school courses in civil aviation.



It began in September 1963 when, "just for something to do," Doug went to the officials of the prison's education department and proposed the course. Although there were neither funds nor facilities available for such a unique program, Doug argued that he could develop, organize and teach the class himself—especially since he was a licensed instructor. The officials made a classroom available, but made it unmistakably clear that Doug's project could not interfere with his regular prison assignments. Knowing of his normal chores and the limited resources, the prison officials were silently skeptical of Doug's chances. They underestimated him. Nevertheless, they gave him a hand.

Through the prison's assistant supervisor of education, Rex F. McMullan, Doug began corresponding with members of the aviation community to obtain current data for his instruction materials. Government offices, his former airline and three major aircraft manufacturing companies provided enough statistical information and charts for Doug to prepare a comprehensive text book titled *Pre-Flight to Flight*. This 150-page manual, which Doug personally wrote, typed, illustrated, mimeographed and bound in his spare time, covers most areas of aeronautical knowledge—the theory of aerodynamics, design of an airplane, instrumentation, navigation, meteorology, teletype reporting, radio direction finding, air traffic control, medical certification and the flight and written prerequisites for a private pilot's license.

For visual aids, Doug fashioned replicas of cockpit instruments from black construction paper, glue and white ink. He also built model planes and displayed other graphic material on magnetic boards.

In one month, Doug had collected enough materials to begin his class. Notices announcing the course were posted on bulletin boards throughout the prison, and toward the end of October Doug opened the door to a handful of curious students. The classes were scheduled for two and a half hours each week for 20 weeks.

One outsider Doug contacted for information was an Atlanta insurance executive, F. R. Hazlewood, who in turn called upon two of his friends to help. One was Paul A. Sanderson, president of a company that produces courses in ground-school instruction. Sanderson donated a set of films for Doug's "Dynamics of Aviation."

Hazlewood's other call was to Lee Mercure, supervisor of the FAA's General Aviation District Office in Atlanta. Mercure visited Doug and learned what had been accomplished. He attended class as an advisor and as guest lecturer and sent FAA pamphlets and publications to all class members. Then, impressed by the professional level of the instruction and the progress of the students, he volunteered to administer the written section of the private pilot examination to all those who had successfully completed "Dynamics of Aviation."

When the test was given to the 19 inmates enrolled in the course, 10 passed. This was discouraging to the inmates until Mercure told them that he had once administered the same test on the outside to 40 students and not one had passed. In Mercure's experience, approximately 70 per cent of those who take the written section of the exam fail on their first try.

Those inmates passing the private pilot written examination were given a certificate which is valid for two years, during which time they must acquire a minimum of 40 hours flying time in order to take the required flight check. Some of the Atlanta penitentiary students involved have less than a year remaining on their sentences. The question is: Will they learn to fly?

John will. Formerly a professional photographer, John was apprehended by the FBI after criss-crossing three continents as a fugitive for five years. Through his good behavior, John had been able to reduce his sentence and will be released on parole in August.

"I was rehabilitated before I entered the penitentiary," claims John. "Five years of not being able to see my family, five years of running with one eye over my shoulder, five years of getting deeper and deeper—that did it. But the aviation course gave me an incentive. It made the time pass by a little faster. Flying has always intrigued me. I joined Doug's class because I saw how much enjoyment the other fellows were getting. When I get out, I plan to get my private pilot's license."

To a second inmate, the training offered at Atlanta produced another reaction: "To me, it means that after having taken so many steps backward in my life, I have finally taken at least one step forward. For the first time in one of these places, I have been given the opportunity to better myself. It wasn't easy. No magic wands or anything of that sort. Just plain studying. Today, though, I can say, 'I've made it'."

Because of his exceptional prison record, Doug will be released in June. "In a way," he jokes, "it's too bad I didn't get more time, so I could see this thing through." Looking ahead to his release, Doug is now training his successor, a tall, thin, bald-headed inmate named Ken. Unlike his mentor with thousands of hours of flying time, Ken has never seen an airplane close up. Doug's homemade model was a revelation. Ken enrolled in the course out of curiosity, studied vigorously, passed the written exam and with the help of men like Hazlewood, Mercure and Sanderson, now will teach the fundamentals of aviation to future students.

Mercure, impressed with Doug's understanding of aviation and his ability to infuse others with enthusiasm and patience, has pledged to make Doug's talents known to those in the aviation business who might benefit from them when Doug gets his second chance.

To inmates not scheduled for early release, the aviation ground course provides diversion from the more austere aspects of prison life. It has proven therapeutic and has provided men with an incentive. But for those who will be leaving Atlanta soon to begin life anew, flying could open new doors of opportunity — vocational and recreational.

By Sue F. Silverman

FAA's Lee Mercure administered the private pilot examination at the Federal Penitentiary in Atlanta.

FLIGHT SAFETY

don't let your engine die of thirst

It seemed routine. The doctor-pilot, flying over mountainous terrain, decided to switch fuel tanks. Within minutes, the engine quit and the doctor was fortunate to survive a crash landing. Investigation showed one fuel tank empty and one full. The pilot had manipulated the electrical switch controlling the fuel gauge system (one gauge for both tanks), but he failed to operate the fuel tank selection valve.

The incident illustrates the cardinal rule of good fuel management: Know your plane's fuel system inside, outside, backward and forward. And think about what you're doing when you do it.

In many accidents, investigators find a full tank on one side and an empty one on the other, *with the fuel selector on the empty tank*. In the confusion of experiencing loss of power, pilots often fail to pinpoint the trouble.

Short-time pilots are not the only ones involved in such incidents. In one recent case, the pilot involved had more than 17,000 hours. Yet, the old, sad refrain of "unfamiliarity" runs through accident after accident. A 1963 crash involving a single-engine plane near Holbrook, Ariz., killed three persons. Prior to the crash, radio calls to Prescott were made by the pilot stating the engine was "cutting out." A full main fuel tank was found in the wreckage. Investigation showed that the fuel system had been modified and the fuel management system differed from the standard system detailed in the operator's manual. The pilot had rented the airplane and, while he had previous experience in the same model plane, he had little in the aircraft involved in the accident.

Diversity of cockpit arrangements calls for close attention. On some planes, the multiple fuel selector valve is in one place and the selective, manually-operated electrical fuel tank *quantity* indicator is in another, with no explanation to the pilot regarding use.

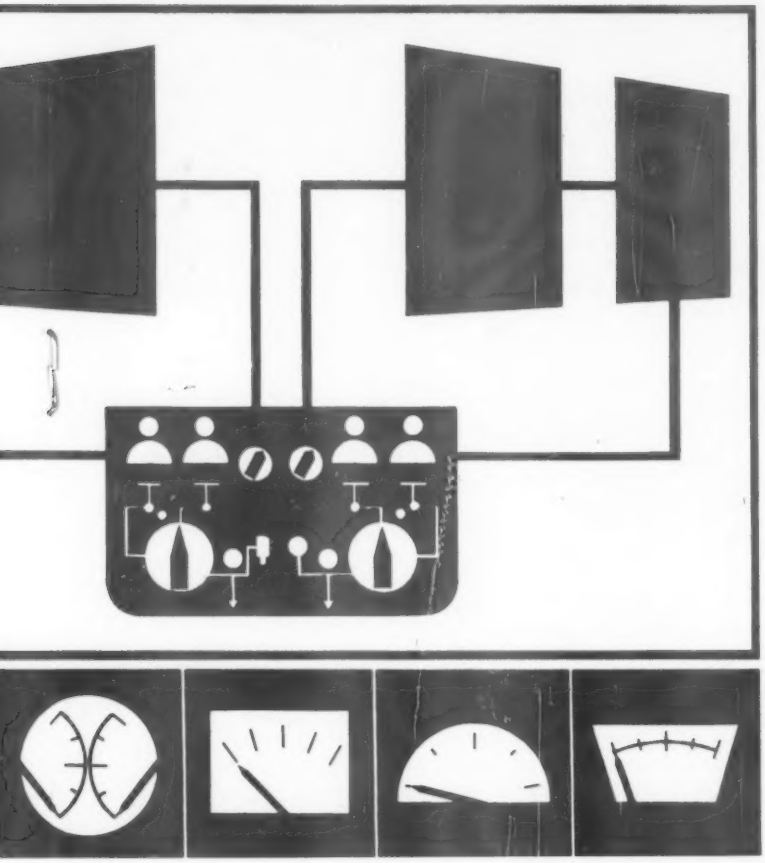
Some models of the same aircraft have at least three different types of fuel selector valves. Two of the types look alike, but there the similarity ends. One type requires the pilot to push the handle down to engage the tank selector "detents;" the other type engages by turning the handle without pushing down. In one case, a plane in this "family" had to be crash-landed short of a California airport after all four occupants tried their luck at shifting tanks. All had flown models which required a simple turn to the full tank, but none knew the aircraft in question was equipped with a type requiring considerable pushing of the handle to get the needed fuel.

Various types of selector handles are used in light planes. Some are mounted at the factory to *point at* the selector position desired by using the handle as a pointer. Others are mounted in such a manner as to *point away from* the position desired.

Serious problems can and do arise at the time fuel tanks are switched. A pilot descending from cruising altitude to locate the airport ran out of fuel on one wing tank. He had to make an emergency landing at night on a street in a residential area, although the other tank was full. He should have switched fuel tanks prior to his descent from his en route cruising altitude.

Not long ago, the selector valve handle broke off in a pilot's hand when he was switching fuel tanks on a cross-country flight in a single-engine, high-performance aircraft. One tank was just about dry and the pilot was switching to the half-full tank. He did not know whether the selector handle broke off while on the empty tank, or had made it to the other tank. This caused him a good bit of anxiety as he was over rugged terrain where a safe forced landing would have been impossible. Fortunately, the se-

Make sure nozzle is grounded to plane.



lector was on the fuller tank and he made it to his intended fuel stop. In the future, he said, he would do his tank switching over an airport, whenever possible. (And try the tank selector on all tanks prior to take off to be sure it's working.)

In a similar incident, a flight instructor shut the fuel off so his student might experience an in-flight emergency. When the engine quit, the student quickly spotted the difficulty and switched the fuel selector on again. The engine didn't catch right away and they lost altitude rapidly. The instructor, not noticing the student's action, became apprehensive about the altitude loss and switched the fuel selector again, in error, to the off position. The plane went in for a crash landing.

In another incident fuzzy instructions proved expensive. One cold, snowy day in Colorado a low-wing single-engine plane taxied to a fuel island. The pilot told the service boy to "top all the tanks." The youngster filled the wing-tanks and then, with his parka over his head and his back to the wind, filled the auxiliary fuselage tank. About 50 gallons of fuel were pumped into the fuselage belly before the service boy realized the auxiliary tank had been removed for repairs!

Certain light aircraft with gravity-flow fuel systems are placarded against taking off or landing on one-tank position. Takeoffs and landings must be made with the fuel selector on the two-tank position. This placard is required because the left-right fuel tank position does not meet the fuel flow requirements for full power climb. In most cases, these planes can successfully perform on the one-tank position. However, under certain conditions, fuel starvation takes place at takeoff.

One engine manufacturer of a popular light aircraft fuel injection engine has a high and low fuel boost position. The aircraft owner's handbook clearly states use of "low boost" for start and "no boost" for take off. "High boost" for takeoff is specifically prohibited. But several accidents have resulted when pilots disregarded this warning and used high boost for takeoff. The high boost is for a hot weather "vapor lock" condition.

Pilots should be alert to the problem of water in the fuel. At strips where planes are refueled by hand pump from barrels, condensation within the barrels can add water to the fuel. The only solution is careful fuel monitoring and use of chamois as a water filter for all refueling operations. *By Cliff Cernick.*

The following summary of "do's and don'ts" of fuel management can keep you flying safely:

- DO be thoroughly familiar with your plane's fuel system and its operation.
- DO know the engine's hourly fuel consumption rate. If it is an unfamiliar aircraft, ask the owner.
- DO check your fuel supply visually if possible.
- DO visually check the fuel selector valve when changing tanks.
- DO make sure, in aircraft with a fuel gauge indicator selector, to change both the indicator selector and fuel valve selector in switching tanks.
- DO check fuel selector valves before takeoff in cold weather. It is possible for a fuel selector valve to freeze into position, making it impossible to select a fuel tank when needed.
- DO learn how to use the mixture control properly.
- DO make a check during preflight of fuselage and external wing surfaces for stains which may indicate fuel system leakage.
- DO keep the tanks full when the aircraft is not in use. Water condenses on the walls of partially-filled tanks and enters the fuel system.
- DO periodically inspect and clean all fuel strainers (screens) and occasionally flush the carburetor bowl as recommended by the aircraft manufacturer.
- DO practice good housekeeping in your routine maintenance.
- DO obtain a copy of FAA Advisory Circular AC 20-43 on Aircraft Fuel Contamination. Write to FAA, HQ-438, Washington, D. C. 20553.
- DO exercise care in flight planning, taking into account headwinds or possible diversion from the shortest course due to weather, causing an increase in fuel consumption. Positively assure yourself you have sufficient fuel, plus reserve, for the intended flight.
- DO use only the fuel recommended by the engine manufacturer.
- DO filter all fuel entering the tank.
- DO drain fuel sumps regularly on preflight and after refueling.
- DO drain half again as much as you believe adequate from each sump.
- DO assure yourself that sump drains are fully closed after draining.
- DO ask your serviceman when his supply system was last inspected for contamination. (You won't hurt his feelings and you may be doing him a favor—he might have overlooked it.)
- DO familiarize yourself with the exact manner of operation of selector valves, handles, gauges and other components of the fuel system.
- DON'T place your faith in a fuel gauge. Make a visual (dipstick) check of tanks.
- DON'T assume tanks are full just because you've instructed a serviceman to "top'er off" or "fill'er up."
- DON'T fly beyond a refueling stop unless the amount of fuel remaining is more than enough to get you to your destination.
- DON'T overlean the mixture to practice false economy merely to prove a bragging point or in the belief it is economical. It's false economy of the worst kind.
- DON'T use additives that have not been approved by FAA.
- DON'T change the fuel selector just prior to takeoff runs.

water, water, EVERYWHERE

and how to get at it

Yes—you can survive in the desert and other areas where water is scarce. All you need is about $1.50 worth of equipment, the strength to dig a hole in the ground, and a warm sun.

Two physicists at the U. S. Water Conservation Laboratory at Phoenix, Ariz., have come up with what amounts to a major advance in survival technique.

Dr. Ray D. Jackson and Dr. Cornelius van Bavel devised a "solar still" which recovers enough water from apparently dry soil to sustain life. If the still is "primed" with chunks of fleshy vegetation—like cactus—it can produce four to six times as much water as it does from earth alone. And the water is as pure and clear as if distilled in a laboratory. However, the water yield is to a large extent dependent on temperature—the higher the temperature, the more the precipitation.

Of course, it takes time for the solar still to produce water, but less than you would expect. The average yield of a simple desert still is from a pint to a quart every 24 hours. That much water, however, can mean the difference between life and death for the pilot forced down in a desolate area without water. This can and does happen, particularly in the West. Every plane flown over desert terrain, and every automobile driven into remote desert country, should carry the makings of a desert still.

The device is so simple that it's a wonder it has never occurred to anyone before. Perhaps it hasn't because prospectors and cowpunchers have regarded desert soil as absolutely dry. And clear plastic has been available only in relatively modern times.

Any scientist engaged in modern water research knows that even dust contains some moisture. Dr. Jackson, who has spent the past four years studying the movement of water in dry earth, says that soil which has dried to the point where plants can no longer live in it still contains around 25 gallons of moisture to the cubic yard. Getting a little of that water out presents no great difficulty.

The desert still has two essential components—a small pail or container and a six-foot square of clear plastic, one mil thick. Such plastic, Tedlar (a duPont product) for example, costs about three cents a square foot. A plastic tube is also useful.

Here's how you build the desert still: First dig a hole about 40 inches wide and about half that deep. It should go straight down at first, then taper to the bottom. If you have a shovel, or a stout stick, so much the better. But your hands will serve as satisfactory emergency digging tools if the soil is not too rocky. Set the pail to be used as the collection vessel in the bottom of the excavation.

Over the hole stretch the sheet of clear plastic, anchoring it around the edges with earth or rocks. After the plastic is stretched, place a small stone in its center to bend the fabric downward, forming an inverted cone.

If the sun is shining, vapor immediately begins to emerge from the soil and condense against the underside of the plastic. Droplets will begin to run down to the point of the inverted cone and fall into the pail.

The reason Tedlar was used is that water adheres to both sides, and the vapor that condenses on the plastic can trickle toward the point. However, if the drops form on something like polyethylene, they are likely to fall straight down and miss the container.

A nonessential but desirable component of the desert still is a long tube of flexible plastic. If one end is taped to the inside of the pail near the bottom, some water may be sucked out within a few minutes. Lacking the tube, a thirsty man may lift out the pail for a small drink, then replace it.

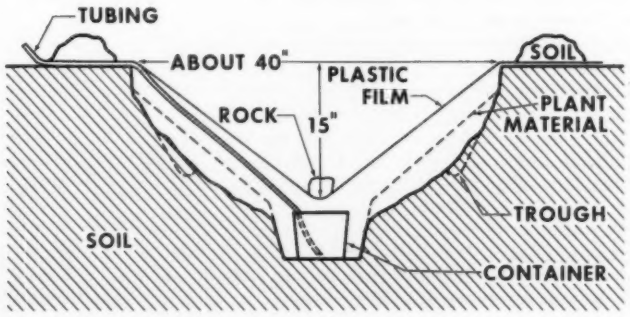
Dr. Jackson found that water yield from a desert still more than doubles when the pit is lined with the pulp of the bisnaga, prickly pear, saguaro or cholla cacti, which are abundant on the western deserts. Slice the cactus flesh so the sun's heat can get at the inner cactus substance. For example, after each prickly pear slab is cut through the center, the chunks should be placed in the pit edge-to-edge with inner surfaces upward. A trough is helpful—see diagram.

The first desert still ever reported was constructed in the Phoenix area on April 20, 1965. It produced a quart of water daily for more than a month, indicating to the physicists that the moisture was being drawn in from the area around to replace that which had been extracted.

The best place to install a desert still, according to Dr. Jackson, is in some dry wash. The next best would be a depression where rain water would collect. Even five or six months after a shower, soil in such locations retains much more water than the higher ground around it. Since it is the heat of the sun that vaporizes the moisture and brings it out for condensation, try to avoid a site that is shaded in the morning or afternoon by a hill or mountain. The hotter the better—thus the survival still is far more effective in summer on an Arizona desert than in the winter on a North Dakota plain.

There's no longer any need for a pilot—or anyone else—to perish of thirst if they're equipped with a few square feet of clear plastic and a pail or tin can.

Dr. Ray D. Jackson, left, and Dr. Cornelius van Bavel.



Photographs courtesy National Geographic magazine
© National Geographic Society

The Josephine Ford was floated from the steamer Chantier to the island of Spitzbergen on four whaleboats. Richard E. Byrd, left, and Floyd Bennett wore Alaskan parkas when they boarded the plane for the flight to the Pole. Byrd was later honored by President Coolidge.

TOP of the World

Shortly after 9:02 a.m. (Greenwich time) on May 9, 1926, Lt. Commander Richard E. Byrd completed his calculations and concluded he was over the North Pole.

Others had tried to fly to the Pole before—and failed. The first was a Swedish engineer named Salomon Andree who set out from Spitzbergen in July 1897 with two companions in a free balloon only to be swallowed up by the Arctic wilderness. The last was Roald Amundsen, the famed Norwegian explorer, whose projected flight to the Pole in May 1925 was forced down less than 150 miles from its goal.

Byrd's interest in the Pole was sparked early in 1924 when he was ordered to Washington in connection with the proposed flight of the Navy dirigible *Shenandoah* from Alaska across the Pole to Spitzbergen. After the project was cancelled, he tried to organize a private flying expedition to the Pole and succeeded in enlisting the support of Edsel Ford and John D. Rockefeller, among others.

In the summer of 1925, Byrd joined an expedition to northern Greenland which would give him an opportunity to acquire some experience in Arctic flying and navigation.

It was on this expedition that Byrd met Floyd Bennett, the talented but unknown Navy enlisted pilot and mechanic he selected to accompany him to the Pole.

In January 1926, the Navy granted leaves of absence to both Byrd and Bennett so they could proceed with preparations for their polar flight. Three months later, they sailed from the Brooklyn Navy Yard in the steamer *Chantier* with a hand-picked expeditionary force of 50 men. In the hold of the ship was a relatively new three-engine Fokker monoplane, named the *Josephine Ford* in honor of Edsel Ford's three-year-old daughter.

The party reached Kings Bay, Spitzbergen, on April 29 to find Roald Amundsen preparing for a polar flight with Lincoln Ellsworth and Umberto Nobile. However, the Amundsen dirigible had not yet arrived, giving Byrd the edge he needed to win the race to the Pole.

At a half hour past midnight, on the morning of May 9, preparations for the polar flight were completed. The *Josephine Ford*, stripped of all excess weight, roared down the snow-covered runway and rose gracefully into the air. The Pole was 600 miles due north into the midnight sun.

With Byrd handling the difficult navigational chore and Bennett doing most of the piloting, the flight proceeded smoothly until the aircraft was approximately one hour from the Pole. Then Byrd noticed a bad leak in the oil tank of the starboard engine.

Bennett suggested that they land and repair the tank, but Byrd decided to continue on fearing a landing on the polar ice might end in disaster. He believed—at least hoped—that the oil would stop leaking when it got down to the level of the break in the tank and that enough oil would remain to get them back to Spitzbergen.

The next hour was filled with tension. But shortly after 9 a.m., Byrd set aside his sextant and scribbled this note to Bennett: "We are now at the North Pole!"

Continued on page 12.

ALASKAN FAA FLYING CLUB WINS TOP AWARD

Robert V. Reynolds, left, assistant administrator for FAA general aviation, accepts the first place "Award for Excellence" from Flying Clubs International in behalf of the FAA Flying Club of Alaska.

The presentation was made in Washington, D. C., recently by Rep. Don H. Clausen of California, president of the Congressional Flying Club, representing Flying Clubs International.

The Alaskan FAA flying club ranked first in Category C "for excellence in management, flight operations and safety and for service to its members during the 12-month period ending June 30, 1965," according to the plaque.

It is estimated that there are more than a thousand Category C flying clubs —clubs with 50 members or less.

Junior College of Aeronautical Knowledge

The FAA joined hands with the District of Columbia Recreation Department to support that group's 14th annual model aircraft building contest. Russell Violett, center, director of a playground in Washington is typical of the adults who guided youthful hands in building some 1,000 models, 300 of which were on display at the Agency's headquarters. David D. Thomas, Deputy Administrator of the Federal Aviation Agency, presented the "Best of Show" trophy.

Safety Stressed In 7th Annual Federal Aviation Agency Report

Continued air safety and more efficient air travel in a year of record activity (fiscal 1965), highlighted the *Federal Aviation Agency's Seventh Annual Report* submitted to the President and Congress last month.

Available for 45 cents from the Government Printing Office in Washington, the report describes significant FAA cost reductions while meeting increasing demand for aeronautical services. Among the many items discussed are the requirement for biennial requalification of all flight instructors and the issuance of a new flight instructor's handbook to be used as a basis for initial flight instructor testing.

Group Named by FAA to Alleviate Problems of Aircraft Noise

The FAA last month established a noise abatement staff to carry out its part of President Johnson's request to "embark now on a concerted effort to alleviate the problems of aircraft noise."

It will be the responsibility of the noise abatement staff, with veteran pilot and career civil servant Raymond A. Shepanek as director, to guide FAA's participation in the total Government campaign to bring relief to areas disturbed by aircraft noise.

His office will work closely with the White House Office of Science and Technology, NASA, Department of Commerce, Department of Housing and Urban Development, and the aircraft industry.

Objectives include the development of aircraft noise measurement standards, formulation of aircraft noise standards, development of air traffic procedures and aircraft operating procedures to minimize noise, and initiation of research programs to provide additional noise alleviation.

Top of the World / continued

After circling the area several times, the *Josephine Ford* turned and headed back to Spitzbergen, all three engines running well. Byrd had been right about the oil leak. Already it was beginning to diminish.

Still the return flight was not without incident. Just as the aircraft left the Pole, the sextant slid off the chart table and broke. Byrd was forced to navigate by dead reckoning all the way back to Spitzbergen.

"We came into Kings Bay flying at about 4,000 feet," Byrd later wrote. "The tiny village was a welcome sight, but not so much as the good old *Chantier* that looked so small beneath. I could see the steam from her . . . joyous whistle."

But Byrd still had one more hurdle to clear. A special committee of the National Geographic Society was established to examine his records and determine whether he had actually reached the Pole. The committee's report stated:

"It is the opinion of our committee that at very close to 9 hours 3 minutes, Greenwich civil time, May 9, 1926, Lt. Commander Richard Evelyn Byrd was at the North Pole, insofar as an observer in an airplane, using the most accurate instruments and methods available for determining his position, could ascertain." *By John Leyden.*

New 'Student Pilot Guide' Heads List of Available Publications

Student pilots, and even those with row upon row of entries in their log books, will find the newly revised edition of the *Student Pilot Guide (Advisory Circular 61-12A)* a mine of useful information.

There is no fat in the booklet, just good reading packaged in an attractive, blue-jacketed 28 pages. Compiled by FAA's Flight Standards Service, the new edition includes several questions and answers which delve into amendment 61-18 of Federal Aviation Regulation 61 which went into effect Sept. 26, 1965.

The circular leans heavily on questions and answers as a method of getting a lot of information into a small space.

Sample Test Questions

Included are 34 sample test questions on general and visual flight rules—with the tantalizing footnote that the answers are to be found in FARs, Part 91. Typical questions are:

- Is an intentional maneuver that exceeds a bank of 60 degrees considered an acrobatic maneuver? (Yes.)
- When operating an aircraft equipped with a two-way radio at an airport with a control tower, is the pilot required to maintain communications with the control tower? (Yes, if entering the airport traffic area.)
- Except when necessary for takeoff or landing, what is considered to be a minimum safe altitude for all flight situations? (Five hundred feet above all structures, people and vehicles and 1,000 feet over congested areas.)
- Assuming there is no altimeter setting available at your airport, what setting would you use for a *local* flight? (Elevation of the airport.)
- What are the basic VFR minimums in a control *area*? (Visibility, three miles; ceiling 1,000 feet.)
- What are the basic VFR minimums in a control *zone*? (Same as above.)

The booklet is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 for 15 cents. Ask for AC 61-12A.

Helicopter Handbook Available

Another booklet now available from GPO will be a valuable guide to applicants for helicopter private, commercial and flight instructor pilot certificates. Titled *Basic Helicopter Handbook,* AC 61-13, it costs 75 cents.

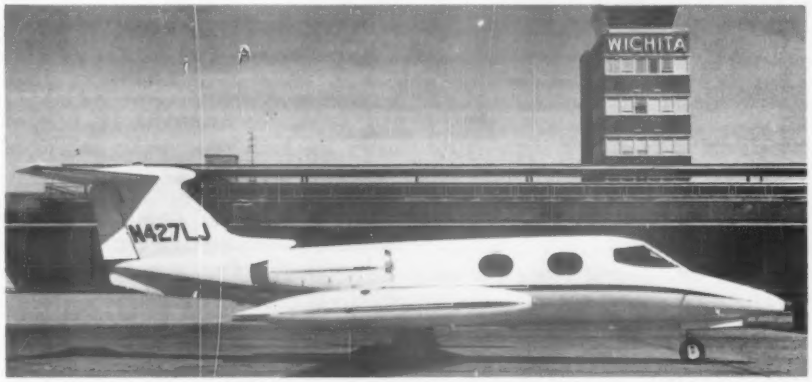
Currently certificated helicopter flight instructors will find the booklet helpful as an aid to student training since it gives detailed coverage of helicopter aerodynamics, performance and flight maneuvers.

Other publications available from GPO are:

- *Airport Drainage;* AC 150/5320-5A, 45 cents.
- *Radiation Safety for Civil Airports;* AC 150/5240-6A, 30 cents.
- *Airplane Flight Instructor Examination Guide;* AC 61-11, 45 cents.
- *National Airport Plan;* $1.25.
- *FAA Statistical Handbook of Aviation;* 1965, $1.00.
- *Ground Instructor Instrument Examination Guide;* 50 cents.
- *Flight Test Guide—Helicopter;* 10 cents.
- *Flight Training Handbook;* AC 61-21, 70 cents.
- *Aeronautical Communications and Pilot Services;* 7300.7, $3.25 domestic; $4.25 foreign.

Navajo, Lear Jet 24 Certificated by FAA

Piper has added a new Indian tribe to its growing band with the introduction of the Navajo, *a turbocharged six to eight place twin-engine aircraft. Certificated recently by the FAA, the* Navajo *is equipped with two 310 h.p. Lycomings which give it a top speed of 265 m.p.h. at 16,000 feet, a cruise speed of 251 m.p.h. with 75 per cent power at 21,000, and a 30,000 foot ceiling.*



Lear's sleek new Model 24 appears almost identical to Model 23 but a keen eye would detect a difference in the windshield post. Inside, the story is a lot more dramatic—the 24 is a much advanced aircraft, featuring thicker wing and belly skin, and jet pumps in the fuel system, among a host of other changes. Weighing 13,000 pounds, it is powered by two CJ610-4 General Electric turbojets which push it through the air at 570 m.p.h. (.87 Mach) at 41,000 feet, an altitude it can reach in 15 minutes. With reserve fuel it can fly 1,540 miles. Standard configuration is six passengers plus two crew. It was certificated according to criteria spelled out in Federal Aviation Regulation 25.

36 USAF AERO CLUBS HONORED FOR PERFECT SAFETY RECORDS IN 1965

Thirty-six United States Air Force Aero Clubs were honored with Flight Safety Award certificates from the FAA last month for completing a full year of flight operations in 1965 without a single aircraft accident.

Administrator William F. McKee presented the awards as part of a joint USAF-FAA program to promote general aviation safety through special recognition of flying clubs in the Air Force with no accidents or incidents.

The 85 Air Force Aero Clubs in operation last year, with some 9,200 officers and enlisted members, had 35 accidents while flying light aircraft approximately 193,000 hours. This was the best record compiled since the clubs were organized in 1958. In 1964, for example, there were 47 accidents while flying 177,658 hours.

FAA Administrator William F. McKee with Maj. Gen. George B. Greene, Jr., left, and Lt. Gen. William S. Stone, at the flying safety awards ceremony last month at FAA Headquarters in Washington, D. C.

General Greene Honored

The improvement of the clubs' operations safety record is attributed mainly to centralized club management and the efforts of individual commanders to provide more effective direction and guidance to club activities. The management of Air Force Aero Clubs is under the command of Maj. Gen. George B. Greene, Jr., Assistant Deputy Chief of Staff for Military Personnel and commander of the USAF Personnel Center, Randolph AFB, Texas.

A special award was presented by the Administrator to General Greene for the "... consistently effective results achieved under his leadership in reducing, year after year, the accident rate among USAF Aero Clubs."

On hand to receive safety awards for Air Force units in Europe and Alaska was Lt. Gen. William S. Stone, Deputy Chief of Staff for Personnel.

Other factors contributing to improved safety among the clubs are use of full time civilian club manager-instructors, establishment of revised Air Force regulatory standards with respect to operations, maintenance and training, and greater participation in club operations by senior Air Force pilots. There also has been closer coordination with FAA inspectors regarding aircraft airworthiness, maintenance, proficiency flight checks for instructors and members, and certification requirements for pilot certificates.

Winning Clubs Cited

The 1965 USAF Aero Club winners and sponsoring commands include:

Air Defense Command—Adair Air Force Station, Ore.; Custer Air Force Station, Mich.; Ent AFB, Colo.; Oxnard AFB, Calif.; Richards-Gebaur AFB, Mo.; Selfridge AFB, Mich.; Suffolk County AFB, N.Y.; Tyndall AFB, Fla.

Air Force Systems Command—6594th Aerospace Test Wing, Calif.; Arnold Air Force Station, Tenn.; Hanscom Field, Mass.; Holloman AFB, N.M.; Kirtland AFB, N.M.; Space System Division, Calif.

Air Training Command—Keesler AFB, Miss.; Randolph AFB, Texas; Reese AFB, Texas; Webb AFB, Texas.

Strategic Air Command—Beale AFB, Calif.; Blytheville AFB, Ark.; Loring AFB, Maine; Ramey AFB, P.R.; Vandenberg AFB, Calif.; Walker AFB, N.M.; Whiteman AFB, Ariz.

Military Airlift Command—Hunter AFB, Ga.; Orlando AFB, Fla.

Tactical Air Command—England AFB, La.; Langley AFB, Va.; Luke AFB, Nev.; McConnell AFB, Kan.; Seymour Johnson AFB, Tenn.; Shaw AFB, Tenn.

Alaskan Air Command—Eielson AFB, Alaska; Elmendorf AFB, Alaska.

United States Air Forces Europe—Bitburg Air Base, Germany.

WAKE TURBULENCE

You've Read the Book; Now See the Movie

The wisdom of avoiding the flight path of another aircraft in landing is stressed in this scene from the FAA 15 minute color movie, "Wake Turbulence," available free from the FAA Film Library, Aeronautical Center, Box 1082, Oklahoma City, Okla.

Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• Affirmative, Affirmative, Affirmative

May the Brittain turn coordinator be substituted for the turn and bank indicator required for IFR flight?

If so, is this acceptable for the instrument check ride portion requiring control with reference only to needle, ball and airspeed? If so, will the resulting instrument rating be valid in an aircraft equipped with turn and bank instead?

Dr. John Scott
Norfolk, Va.

Yes, to all three questions.

• 45 Minute Fuel Reserve

Would you please resolve a hangar flying controversy for me? FAR 91.23 requires an IFR aircraft to carry sufficient fuel to proceed to its destination airport, then to its alternate airport, and then for 45 minutes more at normal cruise. Due consideration has been given to weather reports, forecasts and conditions. Here are a few hypothetical questions not involving an actual flight:

(1) If an en route aircraft encounters unreported/unforecast conditions that will cause it to have less than the required "alternate plus 45 minutes" fuel at destination, at what point in the trip (if any) does the flight become illegal?

(2) If you adjudge the above hypothetical flight to be a violation, what procedure/action would the FAA recommend the pilot take after he discovers his predicament, if the nearest airport with IFR minimums or better is farther away than his proposed destination?

(3) What is the true purpose and intent of the 45 minute reserve? Is the fuel to be used or should every IFR flight land at its alternate with 45 minutes of fuel aboard regardless of the unexpected, unpredicted and unreported flight conditions it encountered en route.

New Orleans

The short answers first:

(1) In the strict sense there is no violation; the pilot had no way of knowing. But (2) a pilot under this circumstance should notify air traffic control, explain the situation and follow instructions. If the pilot fails to do this, the FAA may judge that he was in violation. Unless there is carelessness or negligence involved, the FAA is not likely to take action in such a situation if, say, a landing aircraft has only 25 minutes of fuel left aboard instead of 45. (3) The purpose of the 45-minute reserve is (a) to provide for the unreported, unforecast conditions you describe in your hypothetical case and (b) to enable the ATC system to function with enough flexibility to protect the routine and planned operations as well as those involving emergencies and special handling.

Amendment 91.18, which became effective in May 1965, eliminated the 45 minute alternate airport fuel requirement (a) when the first airport of intended landing has a prescribed and published standard instrument approach in accordance with FAR 97, and (b) when there is a forecast of a ceiling of at least 1,000 feet above the lowest initial approach altitude for the airport and visibility is at least three miles (or two miles more than the lowest authorized minimum landing visibility, whichever is greater). A companion change was also made to FAR 91.83 eliminating the necessity for designating an alternate airport under certain weather and forecast conditions.

The key points are that a pilot cannot be held accountable under 91.3 for an unforeseen situation provided he has obtained all information available to him and responded properly. Section 91.25 requires a pilot to report any information relating to the safety of the flight and this could include becoming aware of having less than the required amount of reserve fuel to reach the alternate airport.

• Instructor Sounds Off

I am a certified flight instructor (CFI) at one of the largest flight schools in the United States.

I have two beefs, the first having to do with pay. I receive no salary guarantee or base pay even though I am expected to hang around eight hours a day or more. Some fixed base operators use CFIs as ground instructors, lineboys, salesmen, etc., but pay them only for time spent in the air.

I get satisfaction out of instructing, but it doesn't guarantee enough pay to support a family.

Gripe two: What about the student we have made fly those extra hours for the benefit of smoothness, safety and accuracy, only to discover that the full flight test, as stated in the FAA *Flight Test Guide*, as well as FAR 61, is abused to the extent that only one maneuver is given and the student is passed? How about some regulation or *standardization* for these designees and FAA flight test examiners?

(Name and address withheld.)

The FAA knows the problems of flight instructors assuring themselves an adequate income. We believe they should charge for all instruction given, both ground and flight, without regard to flight time during the lesson.

We are considering proposals that the FARs be amended to require specific ground instruction, as well as flight instruction, for issuance of pilot certificates.

Your comment concerning partial flight tests for some applicants interests us. With the new rule requiring flight instructor recommendations for all flight tests, it is possible the "sampling" test formerly used for approved school graduates may soon be used for all applicants.

This procedure would recognize the flight instructor's recommendation as evidence of over-all competency. It would use the flight test to check only enough of the required procedures and maneuvers to ensure that an adequate standard has been maintained by the instructor.

FAA pilot certificate requirements and flight test standards are being constantly revised to emphasize practical operational competency, with less attention to the fine points of smoothness and coordination, except where safety is adversely affected.

The new Flight Test Guides *will emphasize performance which meets the* objective *of each procedure or maneuver, rather than one which conforms with a single stereotyped pattern.*

The private pilot and multi-engine Flight Test Guides *are to be published by midyear; other* Flight Test Guides *will be revised at a later date.*

• Signal Mirrors? Plastic Canteens?

I enjoyed the article on a survival packet which appeared in the February 1966 *FAA Aviation News*. The Flying Physicians Association would like to urge our members to do something similar to this. I wonder if the author of the article can advise me where he was able to obtain a signal mirror. I have inquired in all the sporting goods stores around Grand Rapids, Mich., and have perused various flying magazines, but have not seen any of these mirrors available. The roll-up plastic canteen is also an item which I have not seen on the market any place.

David C. Boyce, M.D.
Vice President
Flying Physicians Association, Inc.

Answering your last question first, the quart plastic canteen pictured in the survival kit story was purchased at a war surplus store in Washington, D.C., for 39¢. A larger size also sells for 39¢. The store, Surplus Sales Co., 714 Twelfth Street, N.W., also sells 3x5 signal mirrors from GI emergency kits for $2.49 and we understand that the Survival Equipment Co., Oley, Pa., has a catalog which includes these items.

If you cannot obtain a signal mirror, substitute a metal mirror such as the type available from Boy Scout service centers for about 30¢.

The advantage of the soft plastic canteen is that it can be rolled up cigar shaped or flattened out to suit your individual packaging requirements.

• Instructor Likes "Survival Kit"

"Down Is Not Out" (*FAA Aviation News* February 1966) contained some very useful suggestions on the completion of a personal survival kit. As an instructor in Marine Jet Instrument/Refresher Training Squadron, I have enjoyed the well written articles and look forward to future issues.

R. L. Beckwith
Capt. USMC
El Toro, Calif.

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